FCC 17-108 Comments by Harold Hallikainen

These are the personal comments of Harold Hallikainen. I have been an Internet user since the early 1990s and have a fair understanding of network operations (host several web sites and have done hardware and software design of several “Internet of Things” products), but do not consider myself an expert. My experience is as a user of telecommunications provided by Internet Service Providers, but I have no experience from working within an Internet Service Provider.

2. I believe provision of internet access is a “telecommunications service” and not an “information service.” The basic purpose of an ISP is to transmit user defined digital data from one location (defined by an IP address) to another location (defined by another IP address). This is very similar to what a telephone service provider does, and, of course, telephone service providers are regulated as common carriers under title II. Similar services should be regulated similarly.

3. The following comments respond to specific paragraphs of the NPRM. The paragraph is identified as NPRM:nnn where nnn is the paragraph number in the NPRM.

4. NPRM:4. The NPRM claims that the claimed decrease in investment by ISPs in the 20 year period before the change to title 2 regulation and the 2 year period after is due to the change to title 2 regulation. However, early in the 20 year period, high speed Internet access was rare. There was a huge business opportunity in offering high speed Internet access, thus the major investment. Within the past two years, high speed Internet access has become available to the vast majority of the population. New investment is to provide coverage to the remaining high cost customers and to provide upgrades (largely speed upgrades) to existing customers (though many customers may not have a need for such a speed upgrade). Providing service to high cost customers and improved service to existing customers is far less lucrative than providing the original service to low cost customers over the 20 year period prior to the return to title 2 regulation. The timing of such a fall off in investment does not indicate that title 2 regulation was the cause of any apparent investment decrease.

5. NPRM:4. Under title 2, telephone companies and other common carriers have well defined customer privacy rules. See, for example, 47 CFR 64.2001 et seq for strong privacy requirements on telephone companies. I believe it is untrue that privacy regulation by the FTC would be stronger than privacy regulation under title 2.

6. NPRMP:6. Internet access, at its core, is a “Basic Service” of transmitting data over a communications path that is virtually transparent from one IP address to another IP address. The major difference between Plain Old Telephone Service (POTS) and Internet service is that POTS has used “circuit switched” transmission, while Internet uses “packet switched” transmission. As telephone companies discontinue local service over copper, they are also switching to the use of Internet Protocol and are (or, at least should be) continued to be

regulated as a common carrier. An Internet Service Provider is to transmit data from one IP address to another IP address transparently.
7. NPRM:8. The NPRM states that the Telecommunications Act of 1996 notes that “the Internet and other interactive communications services have flourished, to the benefit of all Americans, with a minimum of government regulation” in 47 USC 230(a)(4). It should be noted that 47 USC 230 deals with the “Protection for Private Blocking and Screening of offensive material.” This section says it is up to the market to provide screening of offensive material, not the government’s. Therefore, the government will not regulate offensive material. This section does not speak to whether the telecommunications services provided by Internet Service Providers should be considered common carrier or not.

9. NPRM:8. The NPRM points out that 47 USC 230(f)(2) defines an “information service” as “... including specifically a service or system that provides access to the Internet.” It should be noted that 47 USC 230(f) states “Definitions As used in this section.” Since this section speaks to “Protection for Private Blocking and Screening of offensive material,” it cannot be relied upon in the determination as to whether Internet Service Providers should be regulated under title 2.

10. NPRM:9. The NPRM cites letters from Congress at https://ecfsapi.fcc.gov/file/2038710001.pdf as in indication that Congress did not intend for ISPs to be regulated as telephone companies. The first of the cited letters (from John D. Rockefeller IV) concerns ISP contributions to the Universal Service Fund. His letter says “We believe it is also imperative that the Commission revisit its decision regarding the exemption of Internet service providers from universal service contributions and access charges. New reports of offerings of voice to voice telephony and fax services over the Internet -- the providers of which do not pay either either access charges or universal service contributions -- indicate that these providers are are indeed now offering telecommunications services, and that they should incur universal service obligations. Like long distance carriers, these providers rely on the local phone network to receive and deliver their services. They should not be allowed to continue to burden without paying their fair share for its upkeep.” If anything, this letter recognizes that Internet service providers are telecommunications carriers and should be regulated as such.

11. NPRM:9. A second letter (the “Five Senators Letter”) takes the opposite stance (that quoted in the NPRM) that ISPs should not be considered telecommunications carriers and be subject to universal service contributions. While discouraging considering regulation of ISPs as telecommunications carriers, the letter continues “In arguing for the extension of direct universal service obligations to ISPs, the development of “Internet telephony” services is cited as the primary reason why ISPs should contribute directly to universal service. While various types of Internet telephony now are being tested, such services currently are not good substitutes for traditional telephone service. Nevertheless, because the advent of Internet telephony does raise some important policy issues we urge the FCC to carefully monitor developments in this area. In short, while we believe that it would be appropriate for the FCC to initiate an inquiry to better understand the the emerging Internet telephony marketplace and its potential impact on the public switched network, given its early stage of development, such services should not become

an excuse for regulating information service providers." Thus, nearly 20 years ago, Internet telephony was not sufficiently developed to consider regulation of ISPs in the same manner as telephone companies. In the intervening 20 years, Internet telephony as well as video conference, and various other communications techniques are well established and ready for regulation in a manner similar to POTS.

12. NPRM:9. In the third and final letter, Senator John McCain makes a strong argument that Internet access is an information service. However, in this 1998 letter, he states "Recent public announcements about the advent of commercially available "Internet telephony" services suggest a possible partial convergence between information services and telecommunications. It would be grossly premature, however, to attempt to address these services today, given their early stage of development." Now that these services *have* matured, it is indeed time to address these services with a fresh look.

13. NPRM:10. The NPRM cites the Stevens Report (a report to Congress on the Universal Service Fund) in support of ISPs being an "information service" instead of a "telecommunications service." While the report supported such a conclusion in 1998, the reasoning behind the support may no longer exist. For example, paragraph 25 defines an enhanced service "to include services offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information; provide the subscriber additional, different, or restructured information; or involve subscriber interaction with stored information." Thus the enhanced service is provided by web servers, mail servers, and similar computers while the information from these computers is transmitted unchanged over common carrier transmission facilities to the consumer. There is a clear division here: the "enhanced service" or "information service" is provided by an "edge provider," while transmission is provided by a telecommunications service which should be regulated as a common carrier.

14. NPRM:10. Paragraph 25 of the Steven Report continues "Enhanced services involve "communications and data processing technologies . . . intertwined so thoroughly as to produce a form different from any explicitly recognized in the Communications Act of 1934." Internet telecommunications is *not* so intertwined so thoroughly as to produce a form different from any explicitly recognized by the Act. An ISP passes data from one IP address to another. An information service provider accepts data from a consumer (often a request for specific content) and delivers that content to the consumer over a (packet switched) circuit provided by a telecommunications carrier. The ISP acts as the telecommunications carrier the consumer deals with, just as a consumer deals with a local telephone company for his/her access to the international telephone network A Telephone Service Provider is a common carrier. An Internet Service Provider provides a very similar service and should be regulated similarly.

15. NPRM:10. The Stevens Report is extensive and cannot be fully analyzed here. However, a few points stand out. In particular, footnote 106 says that protocol conversion within the

telecommunications network does not make the telecommunications network an “enhanced service” or “information service” if the consumer is presented with the same protocol at both ends of the connection.

16. NPRM:10. Stevens Report paragraph 55 states “Internet service providers themselves generally do not provide telecommunications. In those cases where an Internet service provider owns transmission facilities, and engages in data transport over those facilities in order to provide an information service, we do not currently require it to contribute to universal service mechanisms. We believe it may be appropriate to reconsider that result, as it would appear in such a case that the Internet service provider is furnishing raw transmission capacity to itself.” Today, an ISP provides raw transmission capacity to end users. An end user creates a packet using the Internet Protocol. The ISP (working with other telecommunications networks) passes that packet to the user-determined IP address and routes any response back to the end user. This is pure telecommunications.

17. NPRM:10. Stevens Report paragraph 76 states “Internet access providers typically provide their subscribers with the ability to run a variety of applications, including World Wide Web browsers, FTP clients, Usenet newsreaders, electronic mail clients, Telnet applications, and others. When subscribers store files on Internet service provider computers to establish "home pages" on the World Wide Web, they are, without question, utilizing the provider's "capability for . . . storing . . . or making available information" to others. The service cannot accurately be characterized from this perspective as "transmission, between or among points specified by the user"; the proprietor of a Web page does not specify the points to which its files will be transmitted, because it does not know who will seek to download its files.” At the time this report was written (1998), IPSs indeed subscribers the ability to run a variety of applications *on computers owned by the ISP*. The ISP would offer a subscriber “shell access” to run the applications on the ISP computer. The offering of this service was indeed not telecommunications. The telecommunications component (between the user and the ISP, typically over dial up telephone circuits, and between the ISP and other networks, typically over leased lines) *was* a telecommunications service and regulated as such. Today, these services are performed on computers owned by the end user, and the ISP merely transports IP packets from one IP address to another. The sentence on the proprietor of a web page not specifying where it will be transmitted is interesting. The FCC did not consider the telephone call that carried “fax on demand” (such as that offered by the Commission in the 1990s) an “information service” because the did not know who would fetch the fax. Making the fax or web page available on a server is indeed an information service. The transmission of that fax image or web page at the request of a user is a telecommunications service.

18. NPRM:10. In paragraph 81, the Stevens Report states “Internet access providers, typically, own no telecommunications facilities.” This is clearly not the case today. Internet Service Providers today own copper pairs for DSL, coaxial cable for cable modem service, and optical fiber for fiber Internet access. To the extent that there are providers continuing to provide dial-up Internet access where they use title 2 circuits (PSTN) to connect to the end user and title 2

leased lines to connect to the remainder of the Internet, these providers could continue to be considered information services in that they are not transporting data but relying on others to do so. ISPs that do own telecommunications facilities, whether copper pairs, coaxial cable, or optical fiber, should be considered telecommunications services and regulated in the same manner as other telecommunications services.

19. NPRM:11. This paragraph references the 2002 Cable Modem Order. In this order, the Commission decided that because cable modem service typically offered email service, news reader service, DNS, and other computer processing services along with Internet access, the cable modem service, including the telecommunications service that was part of the package, was an "information service" since the services were inseparable. I believe the services are separable. The Internet access provider is providing telecommunications from the end user to any IP address, including those of services that happen to be offered by the ISP. In addition, in the intervening years, the public has come to rely less and less on "information services" provided by Internet access providers. For example, today, one billion users use email services provided by Google instead of that provided by their Internet access provider (https://www.digitaltrends.com/web/gmail-joins-the-billion-users-club/). Internet access providers are discontinuing the provision of email (https://www.verizon.com/support/residential/email/migrations.htm). Consumers benefit by relying on Internet access providers to provide telecommunications and other providers to provide information services such as email since they can then change Internet access providers while keeping their email address. The telecommunications services offered by ISPs are today clearly separable from any information services offered by the ISP, and the vast majority of the value to the consumer is in the telecommunications portion of the offering.

20. NPRM:11. As mentioned above, the Cable Modem Order also mentions DNS. DNS is the "phone book" associated with the Internet Protocol. Users can establish communications over the Internet without use of DNS by merely specifying the IP address with which they wish to communicate. If the user does not know the IP address, he/she can look up the IP address using DNS. The DNS service can be offered by an ISP or by a different DNS provider (for example, Google DNS at https://developers.google.com/speed/public-dns/). The user's computer uses the IP address provided by the DNS server to make contact with the remote user or computer. This is similar to a telephone company (LEC) or a competing company offering telephone directories. It is also similar to an LEC or other companies offering 411 directory assistance, including where the directory assistance offers to complete the call for the user without the user needing to separately dial the telephone number (similar to the user's computer automatically connecting to an IP address based on a DNS response). DNS is clearly a service that is separable from the basic telecommunications service offered by Internet access providers.

21. NPRM:12. This paragraph states that in "June 2005, the Supreme Court decisively upheld the Commission's 2002 classification of broadband internet access service over cable systems as lightly-regulated Title 1 information service." While the Court did indeed make this decision, it

determined that the decision was “permissible” under Chevron where the Court must defer to the regulatory agency to resolve ambiguities in the statute. It was not a resounding endorsement of the Commission’s decision, but merely a determination that the decision was acceptable because it was “reasonable,” even if there were other reasonable (perhaps more reasonable) decisions available. Further, the Court quotes Chevron as saying “An initial agency interpretation is not instantly carved in stone. On the contrary, the agency . . . must consider varying interpretations and the wisdom of its policy on a continuing basis.” This is indeed what the Commission did in 2015 when it decided that those providing Internet access were indeed telecommunications providers that should be regulated under title 2. Internet access providers today do not offer an intermingled package of inseparable services, one of which is telecommunications. The Internet access provider offers telecommunications and *may* offer other separable services with or without additional charge.

22. NPRM:14. In reference to the 2005 Wireline Broadband Classification Order, the Commission uses the flawed and outdated reasoning that services beyond telecommunications are inseparable from the telecommunications services offered by Internet service providers to determine that Internet access provided over wirelines is an “information service” and not a telecommunications service. This appears to be an attempt to make the wireline service consistent with other decisions on Internet access instead of making them all consistent with telecommunications such as the PSTN.

23. NPRM:15. This paragraph references the 2005 Internet Policy Statement. This statement outlines unenforceable policies where it would be nice if Internet services providers complied with these policies. However, since these are policies that are not rules that were developed in compliance with the Administrative Procedures Act, they were not enforceable and provided regulatory uncertainty to Internet service providers.

24. NPRM paragraphs 16 and 17 describe how other methods of delivering Internet access also are classified as “information services” because the telecommunications portion was inseparable from other services, no matter how minor those services were.

25. NPRM:18. This paragraph discusses the US Court of Appeals for the DC Circuit rejection of the Commission’s regulation of Comcast’s network management practices, including the blocking of peer-to-peer services such as Bit Torrent. In the opinion, the Court says “Comcast concedes that the Commission’s action here satisfies the first requirement because the company’s Internet service qualifies as “interstate and foreign communication by wire” within the meaning of Title I of the Communications Act. 47 U.S.C. § 152(a).” This decision appears to have determined that the Commission did not have authority to prevent Comcast from blocking Bit Torrent by relying on the exercise of ancillary authority. Had the Commission recognized Internet access provision as a telecommunications service under title 2, it would have had authority to establish enforceable rules and Comcast would have had regulatory certainty.

26. NPRM:19, NPRM:20. The Commission adopted the 2010 Open Internet Order under newly-claimed authority under section 706 of the Telecommunications Act. Once again, the court rejected the no-blocking and no-unreasonable-discrimination requirements because the Commission had previously declared that broadband Internet access services were not common carriers. The Commission resolved this issue in 2015 by reclassifying broadband Internet access (both fixed and mobile) as a common carrier, thus making the desired regulations possible. This reclassification was upheld by the DC Circuit Court of Appeals in an extremely detailed and well reasoned opinion (https://apps.fcc.gov/edocs_public/attachmatch/DOC-339799A1.pdf).

27. NPRM:28. This section seeks comment on various aspects of the definition of "information service." Those are addressed here.

28. The NPRM asks how consumers are using broadband Internet access today. Specifically, are they using services provided by the access provider beyond pure telecommunications. As pointed out in paragraph 19, over one billion users use Gmail instead of any email service offered by their Internet access provider. Users are migrating to services offered by companies unaffiliated with their Internet access provider because the unaffiliated service offers more features. In addition, use of an unaffiliated email service allows the user to keep the same email address while changing Internet access providers. Internet access provider Verizon is discontinuing email service "...we've realized that there are more capable email platforms out there." (https://www.verizon.com/support/residential/email/migrations.htm).

29. Consumers are using Internet access to communicate with services offered by companies unaffiliated with the Internet service provider. The top 100 web sites listed at https://en.wikipedia.org/wiki/List_of_most_popular_websites fail to show any web sites hosted by Internet access providers. Consumers are not buying Internet access to access content provided by the access provider. They are purchasing telecommunications to access data provided by others.

30. It is true that many, if not most, consumers rely on DNS provided by their Internet access provider. However, consumers are not reliant upon that service since other DNS services (such as Google DNS at 8.8.8.8) are available. DNS is similar to a phone book. It relates domain names to IP addresses just as the phone book relates subscriber names to phone numbers. The fact that a telephone company provides its subscribers with telephone books does not remove the telephone service from title 2 regulation.

31. The NPRM asks if Internet access is what makes the service capable of "generating, acquiring, storing, transforming, retrieving, utilizing, or making available information." The Internet access provider does none of these. The access provider merely establishes a connection between the consumer and another party who performs the listed actions. It is the web site (such as http://www.fcc.gov) that has generated, acquired, stored, transformed, retrieved, utilized, and made the information available. The Internet access provider merely transmits the request to the information provider and transmits the response back. With a telephone, I can dial "POPCORN" to find out what time it is. I can dial one of many telephone numbers provided by the National Weather

Service to hear the weather. In the 1990s, I could retrieve documents from the FCC using “fax on demand.” None of these convert the telephone call to an “information service.”

32. NPRM:29. This section claims that the use of DNS makes an Internet access provider an “information service.” As pointed out previously, Internet communications is quite possible without DNS, but is merely for the convenience of the user through the use of domain names instead of IP addresses. Further, this is a separable service that could either be considered exempt from title 2 or could be considered network management. Because it is offered by unaffiliated companies, I believe it should be considered an exempt service instead of network management. This paragraph also suggests that because the consumer does not know the geographic location they are communicating with using a specific IP address or domain name, the service should not be considered telecommunications. When a consumer calls an 800 number, the consumer does not know the geographic location they are communicating with. That location may change with time of day or with call center load. The geographic location is not important in determining that this is telecommunications. Further, with telephone number portability, telephone numbers are also not tied to geographic locations. I have a California cellular telephone number but live in Colorado. Is the Commission claiming that my cellular telephone is now an “information service” instead of common carrier?

33. NPRM:30. The NPRM asks if protocol conversion qualifies as a “change in form” of the data to qualify an Internet access provider as an “information service.” The Stevens Report footnote 106 says that protocol conversion within the telecommunications network does not make the telecommunications network an “enhanced service” or “information service” if the consumer is presented with the same protocol at both ends of the connection. IPv4 and IPv6 interweaving is a bit similar to the expansion of the NANP. Over the years, changes have been made, sometimes increasing the number of digits a user must dial. IPv4 and IPv6 interweaving is a network management function that does not exempt the transmission of data from being considered telecommunications.

34. NPRM:31. This paragraph of the NPRM points out that 47 USC 230 an interactive computer service. However, as discussed in paragraph 9, above, 47 USC 230(f) states “Definitions As used in this section.” Since this section speaks to “Protection for Private Blocking and Screening of offensive material,” it cannot be relied upon in the determination as to whether Internet Service Providers should be regulated under title 2.

25. NPRM:32. Similar to 47 USC 231, the definitions in 47 USC 231(f) are “for the purposes of this subsection.” They are ONLY applicable to “Restriction of access by minors to materials commercially distributed by means of World Wide Web that are harmful to minors” and have no bearing upon a determination as to whether Internet access providers should be regulated under title 2.

26. NPRM:33. This paragraph discusses the forbearance of various Title 2 regulations in the most recent order. 47 USC 160 clearly gives the Commission authority to forbear such

regulations. The fact that the Commission exercised this authority does not negate the fact that Internet access is a telecommunications service.

27. NPRM: 34. See paragraphs 10 through 15 above. In the intervening 20 years since these documents were written, Internet access has migrated from mostly to almost exclusively telecommunications.

28. NPRM:36. As discussed extensively previously, today, consumers are seeking telecommunications. They are seeking to send data to servers almost always operated by companies not affiliated with the Internet access provider and to receive data from that server without it being changed in any way. Consumers demonstrated this desire for transparent communications when Verizon started inserting “super cookies” in HTTP requests sent by service subscribers to web servers. Consumers deserve and expect transparent transmission of data with no modification.

29. NPRM:37. As discussed in paragraph 20, 30, and 32, DNS is clearly a separate service that may be offered by Internet access providers or others. The provision of DNS is similar to a telephone company providing a telephone book relating subscriber names to telephone numbers (or, for the case of DNS, domain names to IP addresses). The fact that a telephone company provides a customer with a telephone book does not remove the telephone from title 2 regulation. Similarly, the provision of DNS should not remove Internet access from title 2 regulation.

30. NPRM:37. Caching is an interesting subject. I believe that most content caching is being done by Content Delivery Networks that are either co-owned with Internet access providers (see, for example, https://www.verizondigitalmedia.com/platform/edgecast-cdn/) or independently owned (see, for example, https://www.akamai.com/). These CDNs offer service to content providers that are independent of the telecommunications provided to Internet access service providers. The CDN caches content at the request of the content owner (with the content owner paying for that service). Content caching without the authorization of the content owner (directing the consumer’s request to a local caching server instead of the content owner’s server) may result in out-of-date content being delivered and reduction of the traffic to the content owner’s server possibly reducing its advertising revenue. Summarizing, CDN caching is a separable service that is not telecommunications. Nonetheless, communications to and from the CDN server remains telecommunications and should be subject to title 2 regulation.

31. NPRM:38, 39. The NPRM argues that reclassification of Internet access from title 2 to title 1 is supported by Commission precedent. DSL, of course, was originally regulated under title 2, then moved to title 1 in an attempt to minimize regulation. The “information service” designation, however, appears to be a stretch. Consumers are expecting telecommunications to access services offered by third parties, not the Internet access provider. Further, when the Commission tried to enact reasonable regulations regarding Internet access, it found these regulations were not permissible *unless* Internet access were considered a common carrier.

Thus, the Commission finally fixed the issue by making Internet access a common carrier. The precedent shows a path of trial and error in an attempt to achieve reasonable regulation. Regulation of Internet access as common carrier is the reasonable result, no matter the path we arrived at it.

32. NPRM:41. This paragraph discusses the MFJ and its relation to Internet access. I believe that “enhanced services” are separable from telecommunications services. The MFJ prohibited the BOCs from offering enhanced services because of the danger of cross-subsidy between the basic and enhanced services causing a disadvantage to other enhanced service providers. Considering Internet access a telecommunications service would permit the BOCs to offer Internet access, while considering it an “information service” would not.

33. NPRM:42. This paragraph discusses traffic exchange between Internet access providers. This is extremely similar to traffic exchange between LECs, long distance providers, etc. that are subject to Commission oversight. The NPRM provides no justification for treating packet-switched interconnection differently from circuit-switched interconnection. Private negotiation over Internet traffic exchange may be suitable, but the Commission should maintain oversight, just as it does for telephone traffic exchange.

34. NPRM:44. As discussed in paragraph 4, above, investment variation is more likely to be due to market saturation than the return to title 2 regulation. Removing title 2 regulation of Internet access providers reduces clarity for Internet access providers. For example, Comcast was not able to determine that it is not permissible to block Bit Torrent traffic. Verizon was not able to determine that it should not modify subscriber traffic through the insertion of “super cookies.” Madison River Communications was not able to determine that it should not block VoIP traffic (see https://apps.fcc.gov/edocs_public/attachmatch/DA-05-543A2.pdf). Regulation under title 2 provides needed clarity for Internet access providers and prevents harm to consumers such as that just listed.

35. NPRM:47. The NPRM further comments that small ISPs will reduce investment due to title 2 regulation. While that may be true (or may be an excuse to avoid such regulation), the alternative is these ISPs being able to block traffic, modify customer data, etc. Is this what we want?

36. NPRM:48. The NPRM points out that US Telecom is concerned about regulatory uncertainty under title 2. However, as discussed in paragraph 34, above, lack of title 2 regulation results in more regulatory uncertainty as demonstrated by suppliers not knowing what is permitted, what is not, and the lack of FCC enforcement capability for what is not permitted.

37. NPRM:50. Specific harms to consumers under title 1 “light touch” are listed in paragraph 34. Consumers need to be able to communicate with any port at any IP address without interference by Internet access providers. There is evidence that these harms are reduced

under title 2 regulation since the Court has determined that rules prohibiting such content are not permitted without title 2 regulation.

38. NPRM:51. Consumers have benefited from title 2 classification in that they know that an Internet access provider will not block use of a VoIP service that competes with their voice service, will not block video that competes with their video services, and will not modify the data they are sending or receiving. In addition, the same privacy requirements that apply to telephone service should be applied to Internet access. Providers should use Customer Proprietary Network Information only as required for network management. Providers should not provide or sell CPNI to third parties for any purpose, including ad targeting.

39. NPRM:53. This paragraph claims that the effect on investment predicted in the Title 2 order has not been borne out by experience, and, thus, the Commission should reverse the decision. As discussed in paragraph 4, above, investment variation is more likely due to market saturation than title 2 regulation. Further, it has been a very short time since the Title 2 order was adopted, so it is impossible to determine the long-term effects. Finally, while investment decisions play a role, they should not be the overriding factor. The government should not change laws to allow bank robbery because bank robbers have reduced their investment in these activities. The benefits of title 2 regulation far exceed any potential investment decline.

40. NPRM:57. This paragraph discusses returning mobile broadband to being a “private mobile service.” Private mobile services are regulated by 47 CFR 90 and includes public service radio, industrial/business radio service, and similar “private” radio services. These services provide dispatch and similar services to public safety agencies and businesses. These services provide communications among a small number of end-points. Commercial mobile radio services are regulated by 47 CFR 20. These services provide communications services to the general public where any user can communicate with any of the other millions of users. Further, as demonstrated above, Internet access is a telecommunications service and remains one whether that access is provided by wire or radio. Classification of mobile broadband Internet access as provided by cellular providers as a “private mobile radio service” appears to be a gerrymandering of the language to achieve a desired result (escape logical regulation). Cellular provided broadband Internet access should remain a telecommunications service and a commercial radio service.

41. NPRM:64. The Commission should not remove Internet access from title 2 regulation and should retain the existing forbearance as is required by the public interest. The number of title 2 regulations subject to forbearance may vary in the future as the Commission gains more experience with broadband Internet access.

42. NPRM:66. As discussed in paragraph 38, title 2 protection of CPNI provides excellent privacy requirements for broadband Internet access providers. Privacy regulation by the FTC would result in regulatory uncertainty since they would only evaluate the individual privacy policies of the various Internet access providers instead of providing concise rules as to what is

permitted and what is not. For example, the FTC has, after seven years of consideration, not determined whether to require “Do Not Track” to be honored (see https://www.ftc.gov/news-events/media-resources/protecting-consumer-privacy/do-not-track). It is unfortunate that Congress chose to disapprove the 2016 Privacy Order. Since the FCC and its predecessors have over 100 years experience in regulating the privacy of telecommunications, they are well equipped to provide consistent rules whether that telecommunications is circuit-switched or packet-switched.

43. Most of the paragraphs starting with paragraph 70 have been discussed above and will not be discussed again. Some paragraphs, however, will receive further discussion.

44. NPRM:74. The Internet Conduct Standard needs to be a clear set of rules that determine what an Internet access provider can and cannot do. It is expected that as time goes on, Internet access providers may attempt to do things which violate the common carrier nature of Internet access. However, unless and until such conduct is specifically prohibited, it is permitted. As harmful conduct is discovered, however, the Commission may enact rules prohibiting such conduct.

45. NPRM78: There is indeed danger that Internet access providers could favor their own content over that of competitors without regulations prohibiting such. For example, as discussed in paragraph 34, absent a regulation prohibiting such, Madison River would be permitted to block VoIP traffic of its competitors, Comcast would be able to block Bit Torrent traffic that may be carrying video that competes with its video services, etc. While antitrust regulations could handle this on a case-by-case basis, clear common carrier regulations, to quote Barney Fife, handle such an issue by “Nipping it in the bud.” In general, if there is not a rule against it, it is permitted. Do we want Internet access providers to block services that compete with their own?

46. NPRM79: This paragraph discusses the possibility of a “curated Internet experience.” This indeed would be an “information service,” however it is separable from the telecommunications service. Such a service could be achieved by using a DNS that only returns acceptable site IP addresses or by blocking access to specific IP addresses. IP address blocking is similar to 900 number blocking. 900 number blocking does not make the telephone a “curated telephone experience” exempting it from common carrier regulation. An Internet access provider may offer a “curated Internet experience” as a separate service, but the underlying telecommunications between the subscriber, the “curation server” and the content server remain common carrier services.

47. NPRM:80. Absent a no-blocking rule, blocking is permitted. A rule is required. As pointed out in NPRM:81, such a rule requires common carrier regulation.

48. **Additional Comments**
I believe there are extreme parallels between Internet access and telephone service. These are discussed in the remaining paragraphs.

49. **DNS** is equivalent to a telephone company providing a telephone directory. Both relate names to numbers.

50. **Zero rating** is very similar to 800 number telephone service. In both cases, a party is paying the telecommunications costs. An 800 number gives a competitive advantage to the holder, but we have long determined that this is acceptable. Zero rating should be offered on a non-discriminatory basis. A content provider affiliated Internet access provider should pay the same price as one that is not affiliated.

51 **Information Service.** The provision of information through a telecommunications network does not convert the telecommunications network to an information system. When I called the FCC fax on demand service, called the National Weather Service for weather, or called a 900 number for information, that act did not convert the telecommunications network carrying the requested information to an information service. The information service connected to the telecommunications network just as I did. We each transmitted information to the other and expected it to arrive without modification.

52. **Prioritization**. Though Internet bandwidth is increasing, it is not infinite. Just as with different rates for day and night telephone calls, the “night letter” for the telegraph, and reduced rates for electricity consumption at non-peak hours, the use of prioritization can result in more efficient use of the telecommunications network. Some traffic clearly requires the lowest possible latency. Interactive voice communications (such as a telephone call or VoIP) requires low latency. High latency makes conversations confusing and difficult. Non-interactive audio and video have a minimum bandwidth requirement for real-time playback, but are not affected by latency. Audio and video for non-real-time playback (such as “pod casts”) do not have latency or minimum bandwidth requirements. Further, Internet access providers must build networks to meet peak demand resulting in excess capacity during non-peak periods (just as with provision of electricity). Shifting demand to off-peak periods results in better network utilization. Applications such as email can easily be delayed a few seconds or minutes to allow for higher priority traffic without adversely affecting email usage. It seems possible for those creating IP packets to include priority information through the Type of Service field of the IPv4 header. IP packet creators would be encouraged to use the lowest priority necessary for the service (and this may change on a packet by packet basis depending on network congestion) through different transport costs depending on the Type of Service priority. Higher priority would cost more. Should an Internet service provider choose to offer “metered access” where a user is charged for the amount of traffic transmitted (most wireline providers do not currently offer metered access while many wireless broadband providers do offer metered service), the Internet service provider could charge different rates based on the Type of Service priority. This “paid prioritization” would improve the efficiency of the network by allocating bandwidth based on the value the user places on the bandwidth.

53. **Mobile Data**. It makes little difference whether Internet packets are delivered by wire or radio. Because it's always possible to "run another wire," more bandwidth is generally available for wired Internet access than radio delivered Internet access (where bandwidth is limited by available RF spectrum, modulation techniques, noise levels, and frequency reuse limitations). Because of the limited bandwidth of mobile data providers, they should charge higher rates for transmission than wired providers, but all other common carrier rules should apply.

54. **Throttling**. Due to limited network bandwidth, the Internet access provider may need to limit the bandwidth available to an individual user. This should only occur when there is network congestion such that not all packets can be delivered to all users. Ideally, decisions on which packets to deliver should be based on the Type of Service priority. Should Internet access providers wish to offer metered service with a "soft limit," they should be able to decrease (throttle) the bandwidth to users that have exceeded the agreed upon limit.

55. In closing, I believe the Commission made the correct decision to change Internet access to being regulated under title 2 as a telecommunications service. I look forward to reply comments and to the Commission retaining title 2 regulation of Internet access providers.

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